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INPUT® Research Bulletin

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A Publication from INPUT's Downsizing Information Systems Program

Downsizing—Who Pays?... Who Saves?

Note: INPUT's new report, Methodologies for Downsizing, examines the processes and methodologies being utilized by firms undertaking significant downsizing efforts. This research bulletin draws on a portion of the research conducted for this new report that will be published in February of 1993.

Chicken or Egg

Clearly, the motivations for downsizing have come from a variety of sources: user demands for increased control over their information systems, the allure of reduced costs and the promise of increased productivity (all facilitated by technology) have fueled the downsizing revolution.

While end users have clearly been key in forcing the issue, INPUT's research indicates that the primary impetus for downsizing comes from corporate and Information Systems (IS) management; and, IS management is clearly in the driver's seat when it comes to implementing the downsizing strategy.

Furthermore, IS management will continue to take a lead role in the information technology management process for post-downsizing, as was indicated by a synopsis of research results.

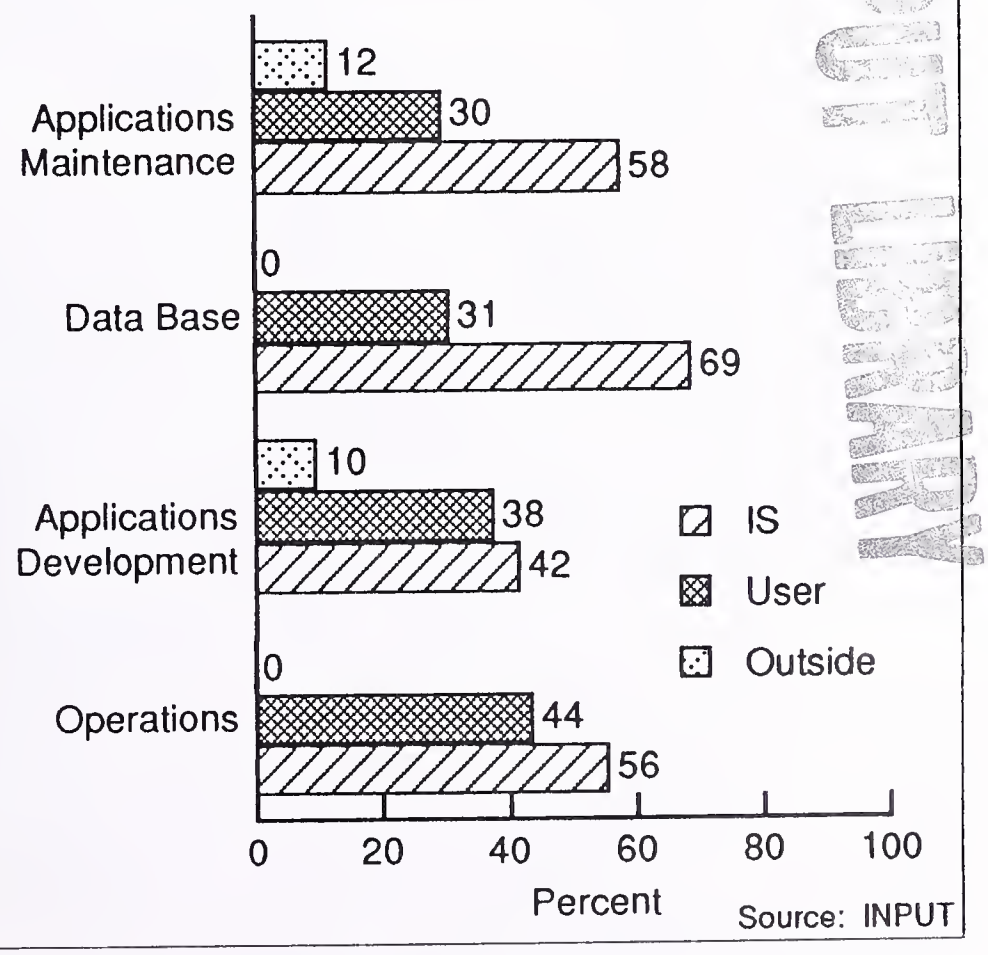
Before downsizing, most of the IS departments (more than 75% of the survey participants) had primary responsibility for the following:

- Operating existing systems
- Developing new applications
- Updating and maintaining existing software
- Data base management and administration

In the post-downsized environment, a significant shift will occur, but as shown in Exhibit 1, the IS functions of the firms represented in the sample will continue to play a significant role in all areas.

Exhibit 1

Responsibilities After Downsizing



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- 56% of the downsized systems will still be operated by IS, 44% by user departments.
- 42% of the IS departments will still have responsibility for new development, 38% will be under the management of end users, and an estimated 10% will go to outside vendors.
- 69% of IS departments will retain responsibility for data base management of central and distributed data bases, but user departments will assume primary responsibility in 31% of the cases.
- 58% of applications maintenance will remain with IS, 30% with the user and 12% will go outside.

Funding the Transition

So, regardless of who started the movement, or for that matter, who's managing it, the questions still remain: who's paying for it, and where does management anticipate that the benefits will accrue?

The answers to these questions raise some interesting issues, particularly in light of the distribution of responsibilities cited earlier.

As part of the research undertaken for the Methodologies for Downsizing study, respondents were asked for the sources and destinations of downsizing funds, and where savings were anticipated. Multiple, but weighted, answers were permitted and responses were normalized to arrive at the following statistics.

On the question of funding the downsizing transition, it appears that responses were divided about equally between corporate, IS and user organizations. This indicates that while IS is likely to be the primary focus of the implementation, the funding will typically be shared by each of the major participants in the effort.

The destination of the funds is to those organizations responsible for the actual implementation; and not surprisingly, the majority will go to the IS organization.

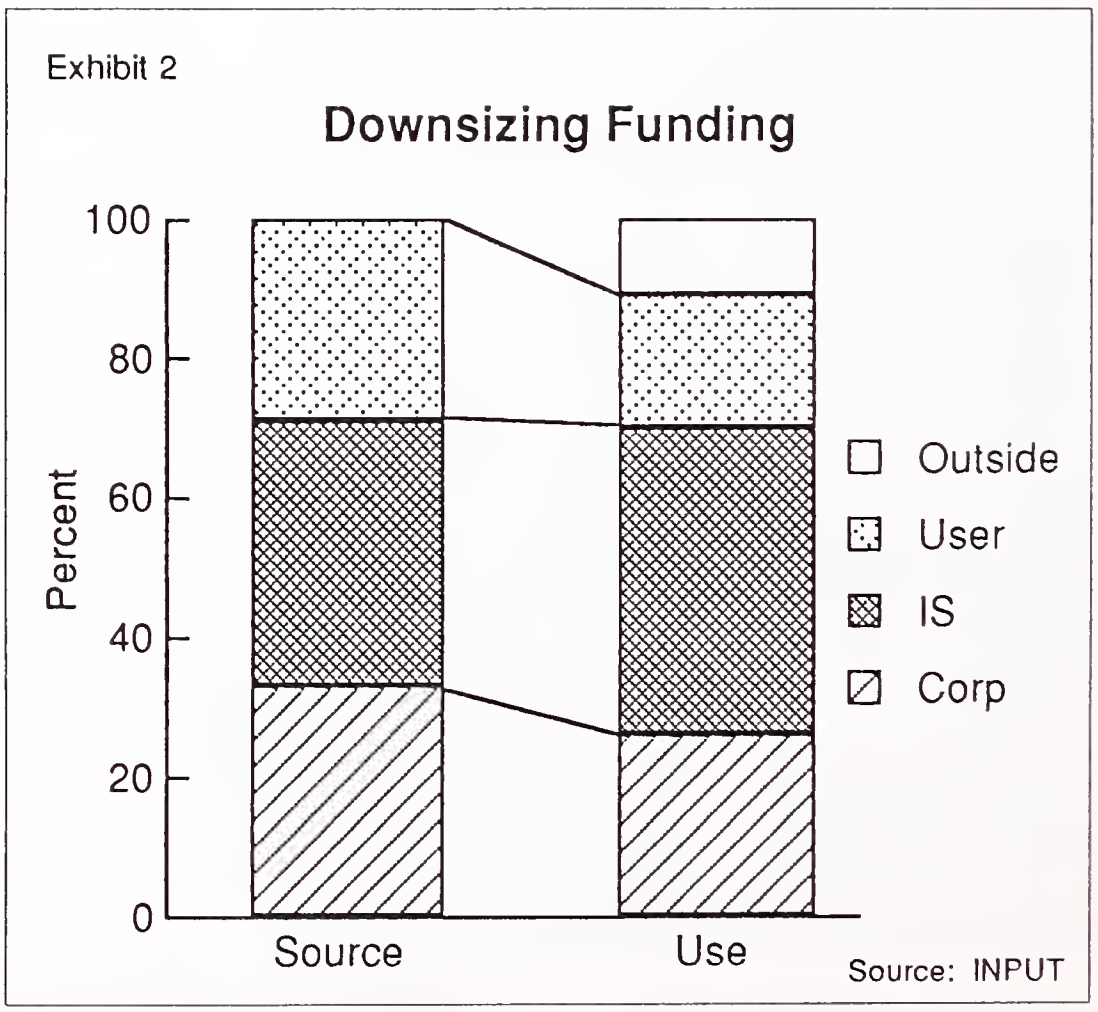
- 26% of the funding will go to corporate
- 44% will go to IS
- End-user departments will receive 19%
- 11% will go to outside software and services firms for assistance during the transition period (this excludes hardware expenditures).

Exhibit 2 summarizes the actual study results regarding the source and destination of funding for the downsizing transition.

Two points here deserve mention:

- The data on use or destination of the funds supports the research previously cited in the

Exhibit 2



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bulletin, indicating that the IS typically takes responsibility for the lion's share of the implementation.

- The 11% of the funding that will go to outside software and services companies (exclusive of hardware costs) represents a significant opportunity for vendors.

From Where Will the Savings Come?

This section will start by pointing out that in 28 out of 30 cases analyzed in-depth by INPUT, over the last half of 1992 there were no significant savings which could be readily identified. Nevertheless, hope springs eternal.

Participants in this study felt that savings could be achieved by reducing expenditures in each of the following four areas.

- Hardware and software expenditures
- IS applications development and maintenance
- Data base administration
- Head count (through improved productivity)

Exhibit 3 indicates the percentage of savings in each category, that survey participants felt would come from the IS department.

Contributions from IS's partners (end users and corporate) in the downsizing venture are not anticipated to be quite so generous.

- In the area of hardware and software savings, corporate and end users anticipated reductions of 21% and 11% respectively, with the other 4% being attributed to reduced outside expenditures.

- Contributions due to reduced applications development and maintenance costs are anticipated to be 15% by corporate, end users by 20% and outside services by 4%.

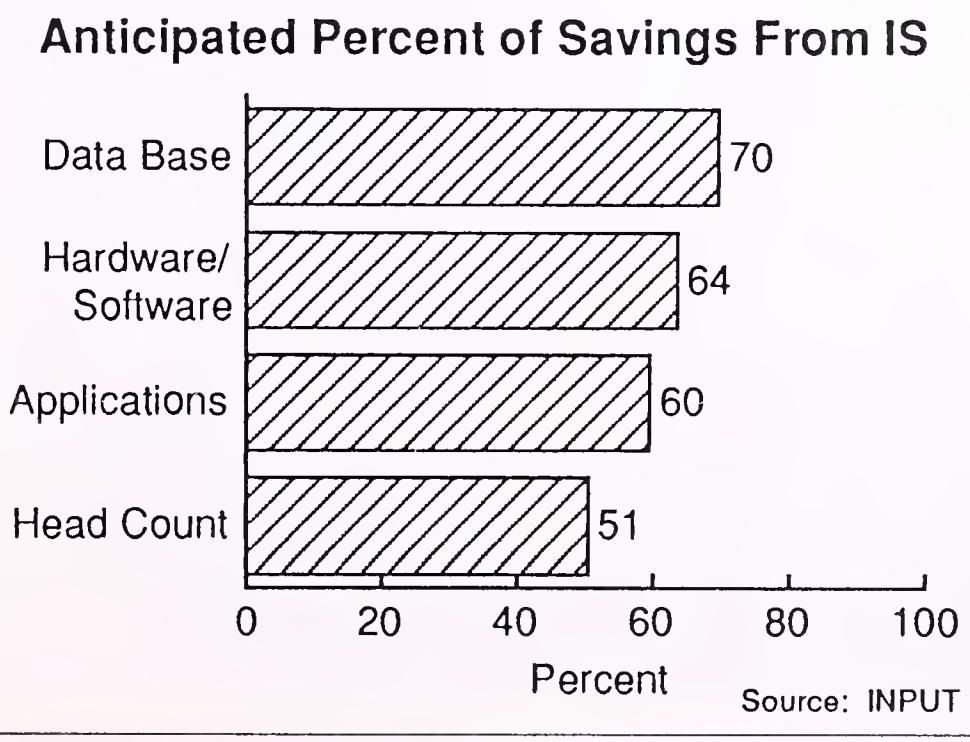
Less than 10% of the sample felt that there would not be any reduction in the end user expenses associated with data base management.

On the question of overall productivity improvement (reduced head count), it was interesting to note that only 25% felt that moving the technology closer to the user would permit significant head count reductions. In fact, only 20% felt that departments other than IS would actually achieve head count reductions.

Clearly, the corporation both "giveth" and "taketh away" from the point of view of the IS executive. Study results confirm that corporate management is directing funds toward the IS department during the downsizing transition period, and then expecting the lion's share of the savings as a result of the downsizing effort to come from that area. This wouldn't be so surprising if corporate management anticipated that IS's role would be significantly reduced in a post-downsized environment.

However, as pointed out earlier, the study results indicate that IS will continue to have significant involvement in most of the major tasks associated with information management (Exhibit 1), even after

Exhibit 3



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downsizing. INPUT believes that this position is clearly and logically inconsistent with management's expectations regarding IS's contribution to the savings.

Perhaps this is the logical trap that has resulted in over 93% of firms reporting no measurable savings as a result of downsizing—particularly with regard to a reduction in head count.

- As long as the "glass house" remains and data is centrally administered, staff reductions in this area will be minimal and head count could actually increase.

- Though the transfer of significant aspects of applications management to end users may reduce corporate IS staff requirements, these reductions are likely to be counter-balanced by increased requirements for development staff in user organizations.

Based on these findings, it seems clear that a realistic model of the post-downsized environment is a necessity if the partners in the process (IS, corporate and end users) are to establish realistic and obtainable financial objectives about "Who Pays... and Who Saves?" through downsizing.

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INPUT® Research Bulletin

Route to:

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Data, Information and Knowledge in the Downsizing Revolution

The 3Rs of Downsizing

When INPUT started the research for *Methodologies for IT Downsizing*, the company published a Research Bulletin that included the "ABCs of Downsizing". Now we will describe the 3Rs of downsizing because it has become necessary to "rethink research during the revolution." What this means is that research focus will shift from the IS department toward end users. While this shift seems simple and obvious, the ramifications are profound and far-reaching. It will require a major change of mind-set among everyone associated with the traditional information technology and services industries!

Lets take a closer look at the 3Rs by using the "besieged castle" metaphor.

- Revolutions are not orderly—especially when viewed from the parapets of the castle built by the IS department with the support of IT vendors. It is difficult for the resident aristocracy of the castle to understand the chaos created by the rabble assaulting the walls. The whole structure of life within the castle is predicated on "top-down design" and the divine rights of logic and lengthy analysis. "Quick and dirty" solutions offend the sensibilities of those accustomed to the courtly procedures and protocols associated with even minor innovations in the existing hierarchy of data or in the flow of information.
- Research among IS royalty, and its appointed vendors, becomes distorted by a "let them eat cake" mentality, which seems to be based on an imperial and patronizing view of what is going on outside the castle walls. This is perhaps best summed up by a leading figure in the development of personal computer software who shall remain anonymous. In the mid-1980s, he stated: "All of the smart people already own personal computers, users now are really dumb (sic)." This is precisely the type of thinking that has led to concerns about "computer literacy" and the desire to transfer the culture of the castle (along with its discipline) to the masses.
- Rethinking basic assumptions about the downsizing revolution (and the revolutionaries) is necessary because those within the castle and those who are storming (or have breached) the walls, don't communicate very well, frequently resulting in conflicting objectives masked by the use of ill-defined computer jargon.

  In fact, even the revolutionaries are having a difficult time communicating effectively. Though they share in common the intent to bring down the current power structure, there

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is little agreement among them as to the "methodology" that will be employed, or, more importantly, what type of order they expect to arise after the chaos.

What this all means is that "researching" the downsizing revolution requires a different approach than has customarily been taken. Even though corporate IS executives of "leading edge" firms remain a valuable source of information, it will become increasingly necessary to broaden our research base to include user departments as well as to develop an accurate picture. Just as IT vendors have been forced to adopt new distribution channels due to the downsizing revolution, so must market research and consulting organizations adopt new "research channels."

INPUT has learned the 3Rs of downsizing, and we have expanded our research approach.

Information, Information Everywhere, and Unsupported by Analytical Data

In the mid-1980s, INPUT found it necessary to differentiate between data, information and knowledge. Essentially, the definitions adopted were:

- Data are anything stored in a computer—text, graphics, programs, full motion video, etc.
- Information is one person "telling" another (or others) something—in person, in writing, by telephone, by broadcast or teleconferencing media, etc.
- Knowledge is the store of human experience, research, experimentation and thought—it is accepted at any given point-in-time as being reality or truth. Knowledge may be generally accepted among groups, or it may be highly personal, based on one's own unique experience. It may be recorded on the walls of caves or in libraries, but most of it remains in the heads of humans.

There is nothing in these definitions that implies information has a certain quality or value. In fact, advertising, propaganda, and even outright lies all fall conveniently under the general definition of "being told." The receiver of the information has the responsibility to evaluate the information to determine whether it contributes to her/his personal knowledge base, and this is a highly personalized process. Give scientists or executives the exact same set of facts or information, and you can get entirely different conclusions or decisions.

Scientists can't seem to agree among themselves about either the nature of the universe or what is, or is not, good for ones health; executives can find data to support any decision, and receive more information than they have time to "process." However, it is important to note that information is increasingly being transformed into data—it originates and is stored in computers where it is available for processing. The problem is that facts and knowledge are being lost among the "noise" being generated by the enormous volume of published information that is indiscriminately being transformed into data.

Data, Data Everywhere and Hardly Time To Think

In INPUT's earlier downsizing research, we asked about the assumptions that are going into cost-benefit analyses of downsizing. One interviewee stated that executives based their assumptions on "what they read in the newspaper." With all due respect to the computer industry trade press, INPUT found that frightening. Everyone with a personal computer seems to be turning out articles on information technology these days; unfortunately, too many of them are being published. No one can keep up with (read) all of the opinions being expressed by "experts" whose only computer experience has been with a word processor and graphical-user interface.

However, as this published information becomes data, the very technology that created the information overload problem in the first place has the potential of mitigating it. The Computer Select data base on CD ROM has 613,630,977 bytes of data (9/92), representing a substantial portion of the recently published

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articles on computer technology. This is the equivalent of over 300,000 pages or a stack of paper over 51 feet high—all on a single disk. That is downsizing on a grand scale!

This is more information than the average person reads in a lifetime. However, because these data are in machineable form, it is possible for the computer to "read" them for us. In seconds, people are able to determine that "only" 912 of over 75,000 documents make any mention of downsizing. Even reading and understanding the abstracts of over 912 articles can be a formidable task, and analysis of over 900 articles is more desk research than can be justified for any single research project. More importantly, even preliminary analysis will disclose the scientist's and executive's dilemma—there are data to support any conclusion that one might like to reach on either technological or organizational downsizing.

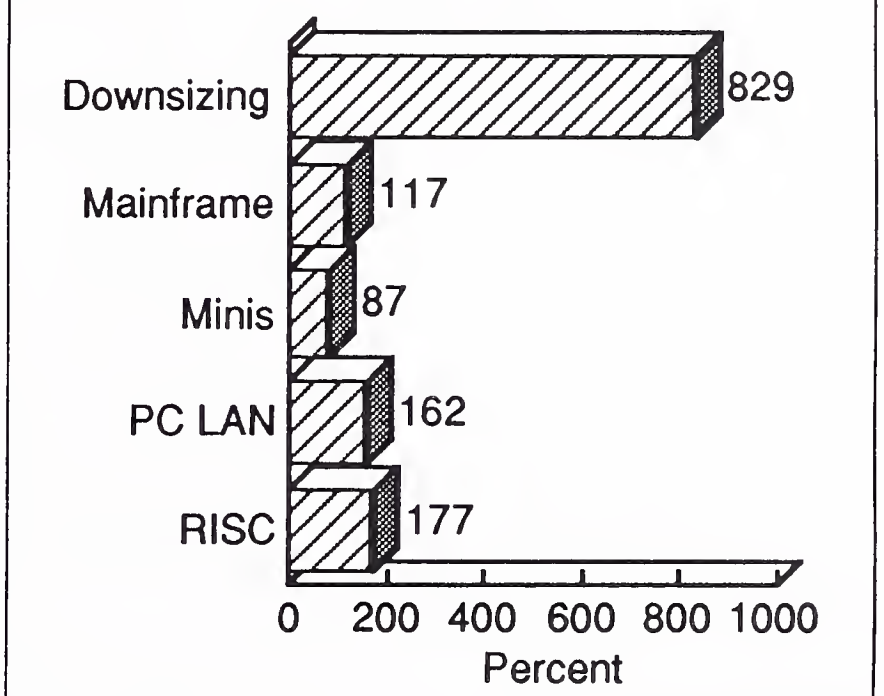
The information content of these data varies considerably in terms of its quality. Some of the documents are from respected professional journals, and some are thinly disguised puff pieces sponsored by vendors. There are data, data everywhere and hardly time to think—especially if one starts wandering through the mass of information in search of knowledge.

It is not surprising that executives and latter day "experts" seldom understand that data are not facts, that information is only as good as its source, and that knowledge is hard to identify and very ephemeral in the information technology industry. Access to extensive data bases and enormous processing power does not automatically mean that research and analysis of these data will yield a quality result. That is evident by the quality of what is being published about information technology itself. However, it is still INPUT's belief that information technology is the only hope of solving the problems that information technology is creating. Utilizing a personal computer, coupled with a CD ROM and applying some knowledge of the subject area, it is possible to identify some key trends.

Extracting Meaning from Data

Anyone can determine that downsizing is a popular subject by reading the trade press, and it is possible to quantify that popularity over time by making a few simple queries to perform a "content analysis" of the computer periodicals data base (Exhibit 1). The information in the exhibit comes from Ziff Communications "Computer Select," utilizing the built-in search tools provided by Lotus Development.

Exhibit 1



Source: INPUT

After utilizing "Computer Select," it does not take too long to determine that the number of documents concerning downsizing increased more than 8 fold (from 110 to over 900) between 1990 and 1992, while the references to major platforms remained essentially stable and the number of documents about minicomputers actually declined. There isn't any question that downsizing has become a hot topic in the last two years.

It is also possible to identify the trends associated with downsizing. For example, references to IBM's SAA in downsizing documents are decreasing and references to open systems are sharply increasing (Exhibit 2).

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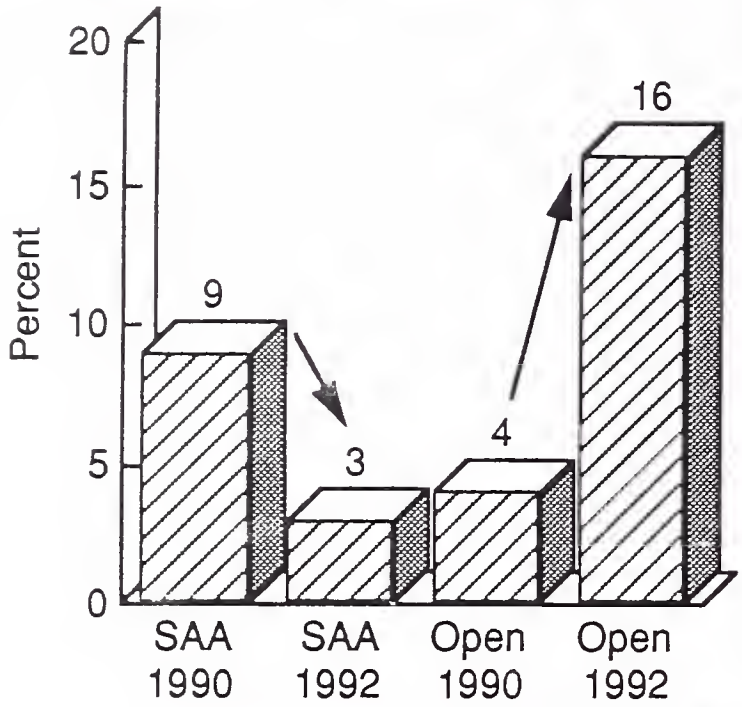
Exhibit 2



Taken at face value, this would seem to indicate that SAA will soon have no role in downsizing, and that open systems are becoming a reality. Only experience and knowledge based on primary research can provide the expertise necessary to refine these simple queries and extract valuable analytical data from this massive data base of published information.

For example, past research indicates that the very term "open systems" means different things to different people, and our "expert system" must be smart enough to reread the 900 downsizing documents many times to determine what is really going on out there. INPUT's report, *Methodologies for IT Downsizing*, will be the first to make extensive use of computer-aided "content analysis". However, even a wealth of analytical data is not enough—the key to valuable information is the knowledge source behind it.

Beyond Information to Knowledge

Though we believe that INPUT has built a substantial knowledge base by doing our "homework" and constantly improving our staff of experienced analysts and consultants, we recognize that our knowledge base has been developed primarily by experience and research in the IT industry itself. While it is only natural that we seek knowledge about information technology among those familiar with it, the downsizing revolution is changing all of that.

The "rabble" outside the castle walls includes professional and management personnel who have the knowledge necessary to make effective use of personal computers, and they are questioning the complexity of the systems that they have been "given" by the IS department. Not only are they saying that there must be a better way, they are taking the initiative in acquiring (and even developing) the tools and applications that they want and need. End users are the only source of knowledge for the products and services that the IT industry (and IS department) should be providing in the downsized world of the 1990s and beyond.

INPUT will place increased emphasis on primary research among end users of information technology starting with *Methodologies for IT Downsizing*.

During a recent COMDEX, it was deplored that the home market for IT products and services had not developed nearly as rapidly as futurists had anticipated and vendors had hoped. INPUT believes that this has occurred because the end users (in this case consumers) have not been asked intelligent questions about what they want and what they will buy and use. INPUT hopes to help correct that situation from a business perspective by expanding our coverage of the downsizing revolution, from the lofty walls of the IS castle, right down among the revolutionaries.

The real knowledge and opportunities are to be found outside of the castle walls!

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Downsizing—New Challenges and Opportunities for Vendors

The impact of downsizing on software and services firms will be just as profound as the impact on the management of information systems within user firms. It will create challenges and opportunities, and may fundamentally change the channel structure, pricing strategies and organization of the industry on a permanent basis. This bulletin, drawn on information from INPUT's soon to be published *The Impacts of Downsizing on Information Technology Vendors*, examines the challenges and opportunities that downsizing is creating for information services vendors.

The two underlying motivations that will change the shape of the information technology (IT) industry over the next 5 years are: the continued migration of buying authority to the end user, and the on-going evolution of client/server (C/S) technology.

End-User Buying Impacts

- As end users continue to take charge of their destiny, the current trend to solution buying will be accelerated. End users, even in post-downsized environments, are more interested in purchasing a solution that meets their needs than they are in building their own. Furthermore, it is unlikely that end users will retain the level of full development staffs that central IS functions have traditionally maintained. Thus, as a focal point for buying shifts, vendors will increasingly need to demonstrate their ability to deliver total solutions.

- Selling to end users has a number of other characteristics that will necessitate changes in vendor strategy. End user executive management is seldom enamored with the razzle dazzle of technology. The primary credibility test for vendors will become their ability to discuss the business issues and solutions that are relevant to the buying executive's area of interest.

- There will be a lot more buyers in any situation. As individual operating units assume responsibility for the bulk of their systems activities, the number of contact points for a vendor in a given firm will grow. Likewise, the coordination and political problems associated in dealing with these diverse interests and priorities will need to be managed on multiple fronts.

- Finally, end users' interests will be focused on results. Methodologies, processes and techniques, although necessary and appreciated, will not take the place of timely delivery of results. End users also will expect vendors to carry more of the responsibility for the delivery of results than has traditionally been the case when vendors dealt primarily with central IS.

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Client/Server Technology

Today, no single vendor appears to provide a complete package in terms of the client/server environment. Some promote hardware, others operating systems, and still others focus on user interfaces. Unfortunately, obtaining a meaningful business solution in the downsized C/S environment requires the successful integration of these "pieces" of technology with effective applications software. Furthermore, vendors (with some exceptions), which have been on the leading edge with some of these technologies, tend to be smaller, under funded and not nearly as well organized on a geographic and marketing basis as they need to be in order to handle the global requirements of supporting decentralized systems for a major corporation.

Whether small or large, all vendors share some common problems brought on by the adoption of C/S architectures.

- Professionals who understand the effective application and integration of these technologies to deliver total solutions are scarce.
- The investment required to move their existing infrastructures and/or products to support the C/S environment is likely to be significant.

Challenges and Opportunities

The forces described above will impact various market segments in different ways. Systems integrators will be impacted differently than, say, network services companies. Let's take a brief look at how four groupings of vendors are likely to be affected:

- Systems integrators and professional services firms
- Outsourcers (traditional systems operations companies)
- Software products and turnkey systems companies
- Network and processing services firms

Systems Integrators and Professional Services Firms

The biggest challenge facing these firms will be the acquisition and/or retraining of personnel in the technologies and disciplines required to deliver downsized solutions. The job will not be made any easier by the fact that downsized environments tend to be heterogeneous with few industry accepted standards. Also, the demand for the limited pool of already qualified professionals will come from user organizations as well as other information services vendors.

On the other hand, with the exception of pure "body shops," most professional services firms traditionally have a vertical market focus, which should be leverageable when selling to end users—many also have significant expertise in specific applications. Retooling these capabilities to deal with C/S architecture should provide significant opportunities.

Outsourcers

To the extent that outsourcers are involved in SI and professional services activities, either as part of their normal business, or stand-alone contracts, they confront the same problems as SI and professional services firms. However, they face some other unique challenges as well.

- Downsizing will gnaw away at the number and size of "glass houses" available as outsourcing targets.
- As users turn to outsourcers to manage their traditional environments while they downsize, outsourcers will be confronted with contracts that forecast decreasing requirements for mainframe cycles and storage over the contract life. This is exactly the opposite of their normal business situation, and works against the outsourcer's traditional business model of leverage through constantly increasing economy of scale.

Nevertheless, some significant opportunities exist:

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- By carefully orchestrating packaging and pricing, outsourcers should be able to make a big market in "transitional" outsourcing as users downsize.

- Downsized environments will provide new opportunities for desktop services as well as the outsourcing of applications management.

Software Products—Turnkey Systems Firms

These vendors will face some of the biggest challenges over the next several years. To meet end user requirements for industrial strength applications, operating on C/S technology in distributed environments will require a complete restructuring of the software industry, its products, methods of delivery and pricing.

- Those firms that have focused on high-integrity applications for the "blue" environment, will need to downsize in order to avoid disaster.

- Firms producing workstation and PC software, traditionally focused on the individual user, will need to think work groups and enterprisewide.

- Everyone will need to think in terms of scalable technology for heterogeneous environments.

And, all this needs to happen in an environment in which development funding is scarce and margins are subject to increasing pressure.

Whereas the challenges are tough the opportunities are significant:

- The demand for industry specific and cross-industry applications software, which operate with integrity on downsized environments, is immense.

- Because few, if any, standards exist, the opportunity to develop (through alliances or alone) distributed integrated platforms, which provide a standard applications development interface for applications software, presents a significant opportunity. These platforms could, in effect, become de facto industry standards.

Network & Processing Services Firms

To some degree, network and processing services firms are less impacted than software and professional services companies by the downsizing trend. Nevertheless, they will be affected.

- For processing services vendors, downsizing poses some threats. As transaction processing costs drop in the face of continued price performance improvements on the desktop, processing services firms will need to be able to demonstrate more added value through application sophistication and functionality in order to compete with a downsized in-house solution.

- Network services companies offering applications will need to provide an increasing number of connect and protocol translation options to service customers with heterogeneous distributed environments.

- Network services companies in the business of providing information will need to consider alternate approaches to the delivery, packaging and pricing of information in the face of constantly decreasing prices for CD ROM and a growing interest in multimedia information systems.

Here again, however, there are some significant opportunities for the taking:

- Faced with more complex network design and management functions, users are likely to look outside for firms that can provide the required management of physical and logical networks.

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Exhibit 1

Downsizing Challenges and Opportunities for IS Vendors

Vendor Class	Challenges	Opportunities
SI and Professional Services Firms	• Developing and maintaining in-house technical expertise • Lack of standardization • Geographic coverage	• Downsizing SI engagements • Downsizing methodologies • Distributed applications templates
Outsourcers	• Fewer/smaller mainframes as targets. • Economy of scale	• Industry specific offerings • Transitional outsourcing • Desktop services
Software Products Turnkey Systems Firms	• Existing product sets • Lack of platform standards • Industry fragmentation and capitalization	• C/S applications products • Distributed integrated platforms (DIP) • Network management software
Network and Processing Services Firms	• Decreasing transaction processing costs • New gateway, protocol bandwidth requirements • Delivery, packaging, pricing	• Network outsourcing • Network management • Specialized transaction processing

Source: INPUT

- Some applications simply cannot be downsized. On-line reservations systems and large customer information files are good examples. Faced with keeping the mainframe to deal with these applications, or utilizing an outside vendor with mainframe processing capabilities, it's likely that users will choose the latter.

Overall Assessment

It's all in your point of view. Whether the glass is half empty or half full will depend on how a particular vendor positions itself to address the challenges and leverage the opportunities. Exhibit 1 summarizes the challenges and opportunities. INPUT believes that the opportunities outweigh the challenges.

- The downsizing revolution is stimulating the first major shift in computing architectures since the advent of the IBM 360, creating major opportunities for outside vendors.
- This shift in underlying architecture is stimulating a major re-engineering of applications suites.

These forces for change, coupled with a growing demand from end-user buyers, should drive more IT dollars into the information services market over the next several years, stimulating growth.

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Client/Server—Three Perspectives on User Requirements

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The Perspectives

Until recently, the IS department and IBM formed a strong coalition which controlled the information technology architecture of most organizations. This team exercised control over technology evaluation and expenditures, standards and the professional staff required to implement new systems. The downsizing revolution and the resulting migration to client/server (C/S) architectures has destroyed that coalition in most instances, and resulted in the emergence of three unique user organization classes with widely varying perspectives and requirements regarding systems planning, technology and systems development.

The three emerging user classes fostered by downsizing are characterized as follows:

- *Compute Intensive* - This user class had its origin in the engineering and scientific community, but has grown to include business and financial analysts, and others outside the engineering community whose analytical requirements are facilitated by the growing capabilities of high-end workstations and networking capabilities.

  Of all the classes using C/S technology, this group reaps the immediate benefit of the hardware's increasing price performance. Furthermore, the growing number of packaged solutions and applications shells provided by specialty software products companies to address general classes of high-end analytical problem solving is minimizing their need for in-house custom development services.

  This user class knows and uses UNIX. It will do its own programming if necessary and generally feels it can manage its own data. Based on past experience, it doesn't expect much help from the IS department.

- *Knowledge Intensive* - This class is represented by office workers and professionals who believe that performance on the substantive (as opposed to administrative) portions of their work can be enhanced by using computer technology. They know what they want to accomplish, but frequently have information systems requirements that go well beyond their capabilities to implement them.

  The types of applications required to support this group are more data-intensive and less mathematically demanding than those of the compute-intensive class. However, in-depth business knowledge is a prerequisite to deliver an effective solution.

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This class is less interested in operating systems or tools. It only wants help in implementing applications.

- *Data Intensive* - This user class evolved from those who adopted the PC in the early eighties. They believe that information technology and data should be distributed freely throughout the organization.

  They use Windows and DOS (or a Mac) and believe that there are sufficient applications packages to permit end users to make effective use of information technology.

Exhibit 1 summarizes the emerging requirements of these three user classes in terms of their needs for data, software, development services and overall dependence on IS.

- The *knowledge intensive* class wants professional resources dedicated to its particular applications arena.

- The *data intensive group* wants easy access to the data bases traditionally managed by IS, as well as information resources outside the firm.

IS is responding to these changing requirements in a predictable way; i.e. by focusing on meeting the requirements of the user class most dependent on their traditional capabilities, and who make up the vast majority in terms of numbers in most companies.

This assertion is supported by data gathered for INPUT's most recent downsizing report, *Methodologies for IT Downsizing*, in which IS executives were asked to rate support requirements.

Exhibit 1

User Requirements by User Class

User Class	Data Needs	Software Needs	Dev. Needs	IS Depend.
Compute Intensive	L	H	L	L
Knowledge Intensive	M	M	H	M
Data Intensive	H	L	L	H

Key: H = High M=Medium L=Low

Source: INPUT

The View From the Information Systems (IS) Department

From the perspective of the IS department, these three classes of users not only contend for common resources, but also have requirements for services and technology that are significantly different from those traditionally provided by IS. A mandated common architecture no longer exists.

- The *compute intensive* faction is interested in taking the money it formerly spent on mainframes and investing it in workstations and software.

Exhibit 2 shows how IS executives rated 13 technologies or capabilities that they said their organizations would require in order to support downsized client/server environments. The results provide insight into which class of users they will be supporting and in what manner.

- The heavy emphasis placed on the first four requirements (LAN Management, RDBMS, Packaged Applications Software, and DDBMS) indicates a commitment to support corporatewide networks and the distributed data requirements of the *data intensive* user class.

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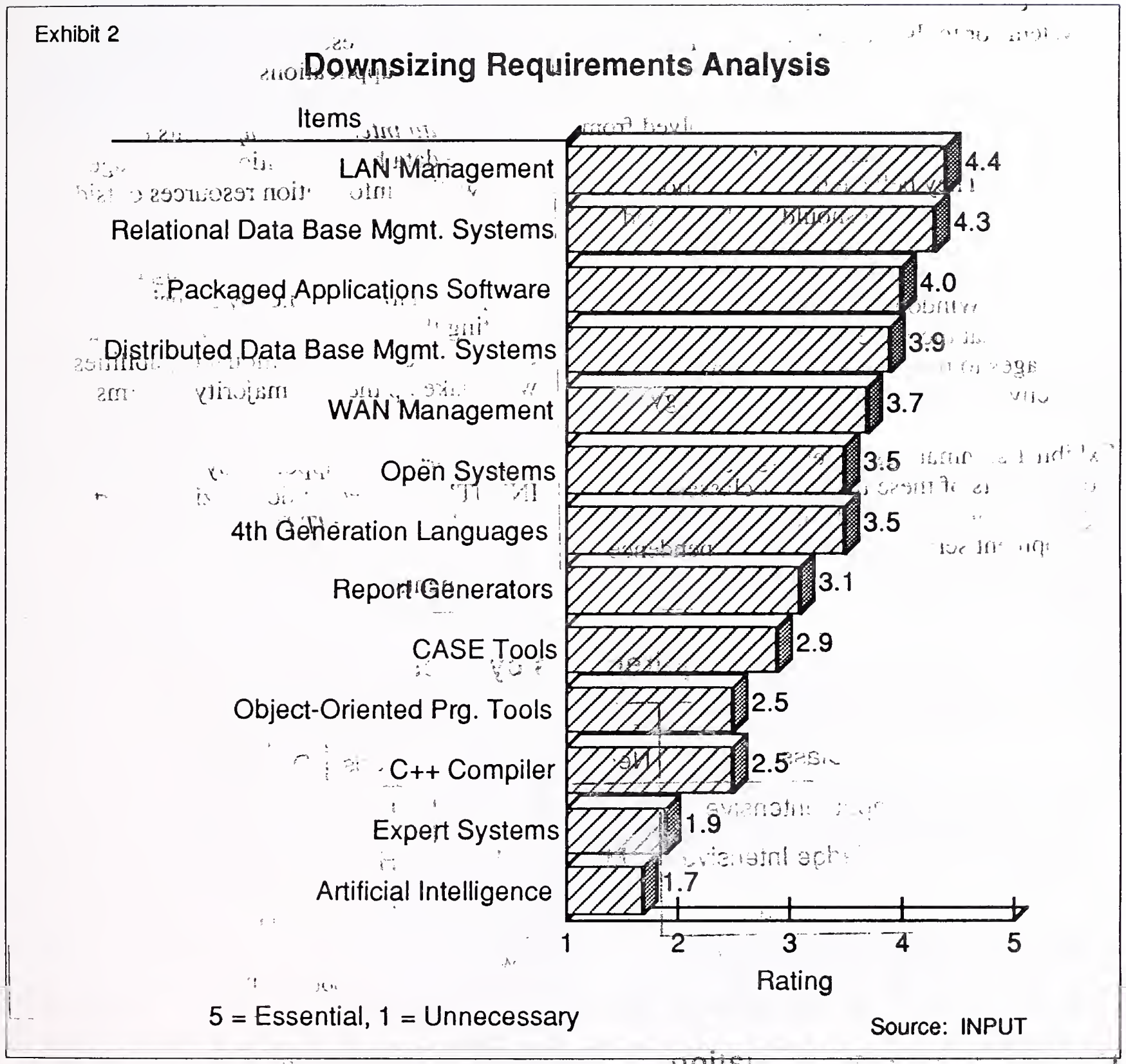
Exhibit 2



- At the other end of the spectrum, there is little interest in CASE tools, object-oriented programming tools, and C++, all key technologies for applications development in the client/server environment. This may indicate that the IS function is backing off of its previous emphasis on custom development; or could simply reflect a priority designed to get the infrastructure and tool kits organized to meet the requirements of the largest number of users, and then worry about involvement in development.

- Finally, there is very low interest at the moment in artificial intelligence or expert systems. This indicates, at least at present, a lack of interest by IS in supporting knowledge-intensive users for whom these technologies are key.

In the final analysis, IS remains on the horns of a dilemma. Lacking the unified architecture that SAA promised to deal with platform diversity in the IBM world, IS must deal with a heterogeneous technology portfolio and at the same time try to meet diverging user needs.

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It is most likely that IS will adopt the strategy indicated by the analysis above; i.e. support the majority of users whose requirements necessitate some centralized network architecture and data management. If so, this will leave two classes of users, the *compute intensive* and *knowledge intensive* to fend for themselves.

This will create new opportunities for information services vendors.

Opportunities for Information Services Vendors

The emergence of three user classes with varying requirements has clear implications for software and services vendors. Depending on how IS responds to each class in a given organization, vendors will find clear-cut targeted opportunities.

If we assume that IS focuses on the network and data management activities described above, then vendors could find:

- Niche opportunities for servicing the *compute intensive* faction through the provision of new hardware and sophisticated applications software.
- *Knowledge intensive* users will require custom development services with a heavy emphasis on industry- or profession-specific knowledge.
- The *data intensive* segment, most likely aligned with IS, will need increasingly sophisticated approaches to data distribution, management and solutions to complex problems involving network management and integration.

Throughout this year, INPUT will continue to examine how requirements for these various classes of client/server users evolve, and the impact that this evolution will have on potential markets and service requirements.

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